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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Paper No. 15

Application Number: 09/108,643
Filing Date: July 1, 1998
Appellant(s): Lenssen et al.

Edward W. Goodman
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 4/30/2001.

(1)   ***Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

(2)   ***Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect

or be directly affected by or have a bearing on the decision in the pending appeal is contained

in the brief.

(3)   *Status of Claims*

This appeal involves claims 1-10.

Claims 11-15 objected to as being dependent upon a rejected base claim, but would be

allowable if rewritten in independent form including all of the limitations of the base claim and

any intervening claims.

(4)   *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in

the brief is correct.

(5)   *Summary of Invention*

The summary of invention contained in the brief is correct.

(6)   *Issues*

The appellant's statement of the issues in the brief is substantially correct. The changes

are as follows: Issues A and C are moot due to the withdrawal of the 112 and 103 rejections.

Issue B remains.

(7) *Grouping of Claims*

Appellant's brief includes a statement that claims 6, 8-10, 14 and 15 stand and fall

together, and claims 1, 3-5 and 11-13 stand and fall together.

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *Prior Art of Record*

The following is a listing of the prior art of record relied upon in the rejection of claims

under appeal.

5,991,085 RALLISON et al. 11-1999

(10) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

1. **Claims 1-10 are rejected under 35 U.S.C. 102(a) as being anticipated by Rallison et al. (5991085).**

2. **As in claim 1, Rallison et al.** teaches of a method for controlling a graphical element on a

display through manipulation of an input device, **column 2 lines 13-31**, the method comprising:

measuring a plurality of components of a magnetic field related to an orientation of the input

device, said plurality of components not being dependant to each other, **column 5 lines 1-20;** and

controlling the graphical element on the basis of the plurality of components, **column 2 lines 13-**

31, column 19 lines 13-20, column 20 lines 37-52, characterized in that the controlling, **figure 27 item 522**, step includes the sub-steps, calculating a first signal on the basis of at least two of the plurality of components, the first signal representing a translation movement of the graphical element in a first direction on the display, **column 27 lines 17-58. column 28 lines 55-60**; and calculating a second signal Y on the basis of at least two of the plurality of components, at least on of the at least two of the plurality of components being different from the at least two components used for calculating the first signal, the second signal representing a translation movement of the graphical element in a second direction on the display, **column 5 lines 10-19,** **column 20 lines 32-45, column 21 lines 1-17**.

3. Wherein Rallison et al teaches of a 3 axis magnetic sensing system, wherein three pairs of orthogonally mounted magneto resistive sensors provide yaw detection. Each pair of sensors are located on independent X, Y, and Z axis. The first signal of the yaw detection is comprised of the sensor pair for the X direction, and a second signal of the yaw detection is comprised of the sensor pair for the Y direction. Rallison teaches "yaw" refers to rotation about the spinal axis. Rotation relates to a vector having a specific arc moving about its origin from 0 to 360 degrees. Figures 30B and 30E demonstrate translation in two different directions, figure 30B the first translation direction and figure 30E representing a translation movement of the graphical element in a second direction. Yaw therefore has graphical translation in more than one direction as illustrated in figure 30. Each of these movements is calculated from the X,Y,Z coordinates that

relate to the specific angle provided by the vector rotating about its origin. Further vector

rotation as view graphically in 2 dimensions inherently includes movement in plural directions,

based on the well known historical and mathematical Euler's equation deriving the vectors X, Y,

and Z components based on the sine/cosine of the angle.

4. Alternatively Rallison teaches of correcting for drift by correcting a direction detected by a

first (inertial) sensor to correspond to a direction sensed by a second (magnetic) sensor,

column 31 lines 50-57. Wherein the inertial sensor measures pitch data and the magnetic

sensor measures yaw data. Therefore the translation movement of the pitch is also calculated

by measured magnetic sensor data because while the pitch is initially calculated by inertial

sensor measurements, a drift correction calculation for pitch is made based on magnetic sensor

measurements, making the calculation of a second signal representing a translation movement

of a graphical element in a second direction on the display, represented by pitch also based on

measuring components of a magnetic field as found in claim 1. Therefore both pitch and yaw

calculations representing translations of two separate orientations are calculated using magnetic

sensor data.

5. **As in claim 6, Rallison et al.** teaches of an input device for controlling a graphical element

on a display, **figure 1, column 2 lines 13-31**, the input device comprising: a plurality of sensors

for measuring respective components of a magnetic field related to an orientation of the input

device and a controller for controlling the graphical element on the basis of the plurality of

components, **column 5 lines 1-20, column 19 lines 13-20, column 20 lines 37-52**, characterized

in that the controller, **figure 27 item 522**, includes calculation means for calculating a first signal

on the basis of data from a least two of the plurality of sensors, the first signal representing a

translation movement of the graphical element in a first direction on the display, **column 27 lines**

17-58, column 28 lines 9-19 and lines 56-60, and second calculation means for calculating a

second signal Y on the basis of data from at least two of the plurality of sensors, at least one of

the at least two of the plurality of sensors being different from the at least two sensors used in

calculating the first signal, the second signal representing a translation movement of the graphical

element in a second direction on the display, **column 5 lines 10-19, column 20 lines 32-45,**

column 21 lines 1-17, wherein in the broadest interpretation of the claims said first and second

calculation means are represented by microprocessor 522 and PROM 524, given it functions as a

calculation means for all measured sensor input.

6. As in claim 3, Rallison et al. teaches of wherein the controlling step includes an initialization

step for measuring reference values of the plurality of components with respect to an orientation

of the input device at an instant of executing the initialization step, **column 25 lines 18-20**, and

wherein the calculating step calculates the first signal on the basis of a difference between current

values and the reference values of respective ones of the at least two of the plurality of

components, **column 25 lines 18-57. As in claim 4**, Rallison et al. teaches of wherein in said

initialization step the measuring step measures three components of the magnetic field resulting in

a measurement of the strength of the magnetic filed, and wherein the initialization step is executed

if the difference in strength of the magnetic field, between two successive executions of the

measuring step, is larger than a predetermined threshold, **column 19 lines 15-20, figure 23, and**

column 25 lines 17-45, wherein said drift/error corrections inherently applies to all sensors as

mentioned on lines 15-20 of column 19, further, **column 31 lines 50-56. As in claim 5,** Rallison

et al. teaches wherein the magnetic field is generated by a permanent magnet or an electromagnet,

column 21 lines 1-15, wherein magneto resistive elements are utilized in conjunction with coiling.

As in claim 8, Rallison et al. teaches of wherein said input device further comprises resent

means for measuring reference data and wherein calculating means calculates the first signal on

the basis of a difference between current data and the reference data, **column 24 lines 32-65. As**

in claim 9, Rallison teaches wherein at least one of the plurality of sensors is an MR (magneto

resistive) sensor, **column 21 lines 1-18. As in claim 10,** Rallison teaches wherein two of the

plurality of sensors comprise an MR sensor, **column 21 lines 1-18**, and wherein a third of the

plurality of sensors comprises a Hall sensor, the three sensors being manufactured on a single

substrate, wherein the printed circuit board, **column 20 lines 38-51**, of the tracker circuit 508, is

equivalent to a substrate which can also include a Hall sensor, **column 31 lines 30-35**.

Claim Objections

7.   Claims 11-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit:

(11)   ***Response to Argument***

A)   The 112 rejection of claims 6, 8-10, 14, and 15 in the Final Office Action filed on
1/5/2001 is withdrawn. Appellants arguments are persuasive.

B1)   Yaw only refers to the X as asserted by the Appellant in a 2 dimensional mouse mode,
column 29 lines 1-20, wherein while in mouse mode operation, X is determined by a scaled
yaw angle calculation. However as illustrated in figure 30, Yaw refers to a rotation about an
axis, having a translation movement in a first direction figure 30B, and having a translation
movement in a second direction, figure 30E.   Rallison teaches "yaw" refers to rotation about
the spinal axis. Rotation relates to a vector having a specific arc moving about its origin from 0 to
360 degrees. Yaw or a rotation vector converted to its Cartesian Coordinate system is much
more than Appellants asserted equivalent to X. In fact Yaw converted to its Cartesian
Coordinates has X, Y, and Z components. Further for any rotation of a vector as viewed
graphically in two dimensional space as shown in figure 30, when converted to its Cartesian
Coordinates system translates to corresponding variations of the X, Y, and Z components
measured by the corresponding orthogonal magnetic sensors arrays. Therefore any rotation of
a vector about its point of origin on the screen inherently describes translation in more than
one Cartesian Coordinate direction. This relationship illustrates the well known and historical
mathematical equation known Euler's Equation.

B2) Rallison further teaches devices are well known wherein the head tracker used only magnetic sensors, column 2 lines 30-35, column 3 lines 1-5, however these devices have limitations, column 23 lines 20-65, that are overcome by inertial sensors. Even though Rallison teaches away from each of the pitch, and roll calculation being derived from magnetic senor information he establishes such systems as being known by his reference to improve on their limitations. Rallison teaches a number of sensor technologies can be used for sensing head movement or position including magnetic sensors, inertial sensors and mechanical sensors, column 5 lines 1-10, column 31 lines 30-38.

B3) Further Rallison teaches of correcting for head tracking drift by correcting a direction detected by a first (inertial) sensor to correspond to a direction sensed by a second (magnetic) sensor, column 31 lines 50-57. Therefore the translation movement of the pitch is also calculated by the magnetic sensor because while initially calculated by inertial sensor measurements, a drift correction is made based on magnetic sensor measurements, making the calculation of a second signal representing a translation movement of a graphical element in a second direction on the display also based on measuring components of a magnetic field as found in claim 1. Therefore both pitch and yaw calculations representing translations of two separate orientations are calculated using magnetic sensor data.

C) The rejection 103 rejection of claims 11-15 in the Final Office Action filed on 1/5/2001 has

been withdrawn. Appellants arguments are persuasive. The claims are objected to as being

dependant on rejected claims 1 and 6.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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